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## (54) Information inclusion in television broadcasting

(57) A television signal is generated which includes at least two video windows 9,3, one containing advertising videos and the other containing text based information, such as news information from an external source, the videos taking up only some of the visible lines of the signal, at least part of the remaining lines, or the vertical blanking interval, being encoded with non-video data representative of programme schedule information for a number of channels. At the receiving end, the encoded data is decoded, mapped onto locally generated channel numbers and displayed as video information in the lines of the video signal which are not used by the other video windows 16. A locally generated ticker may be used to display local information such as traffic news or emergency warnings.

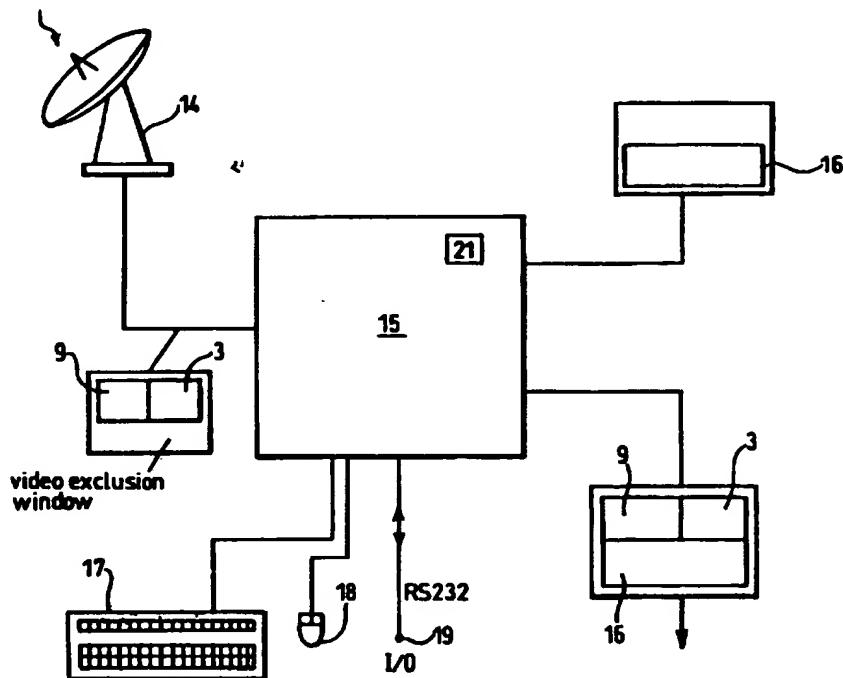
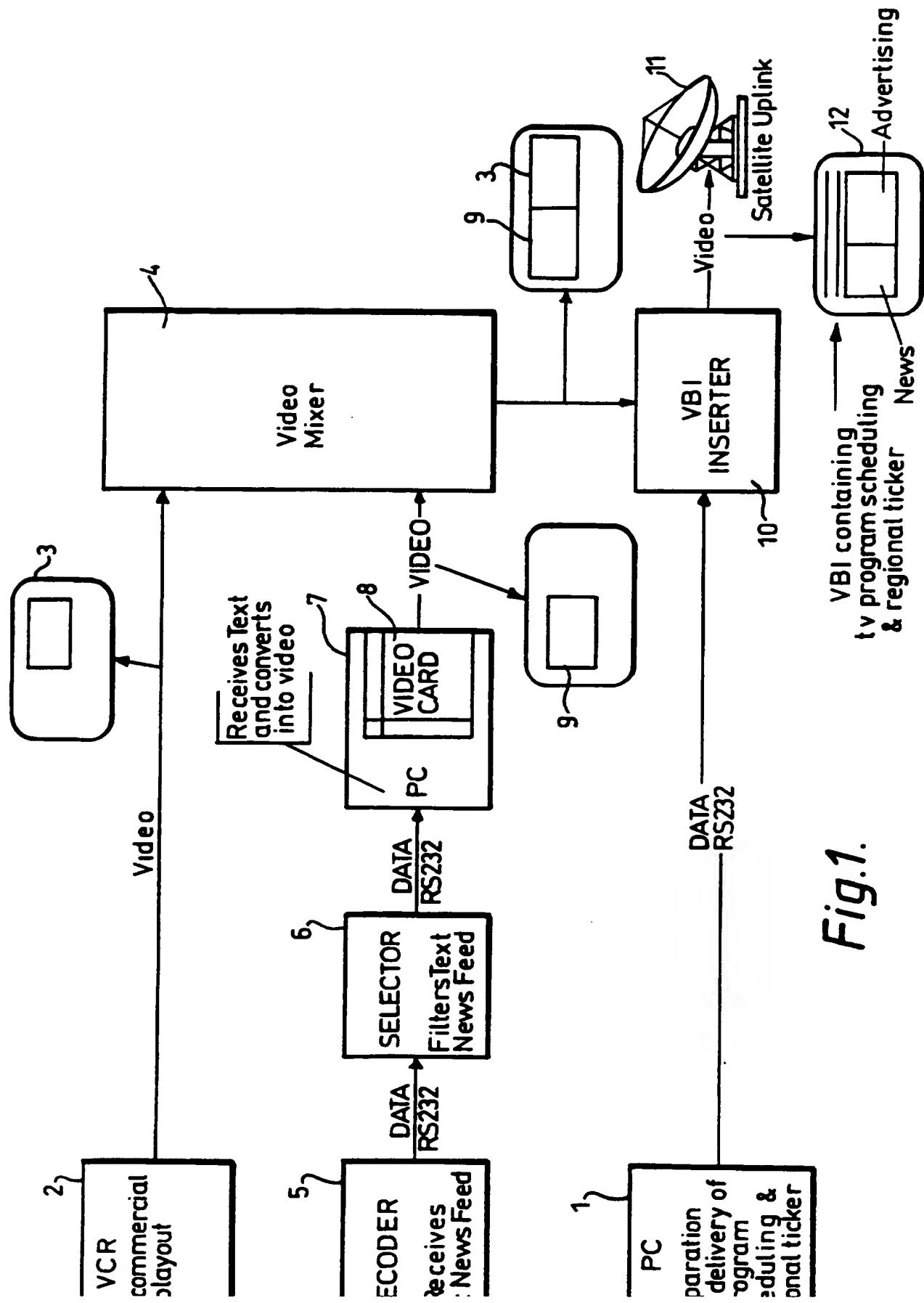


Fig.2.

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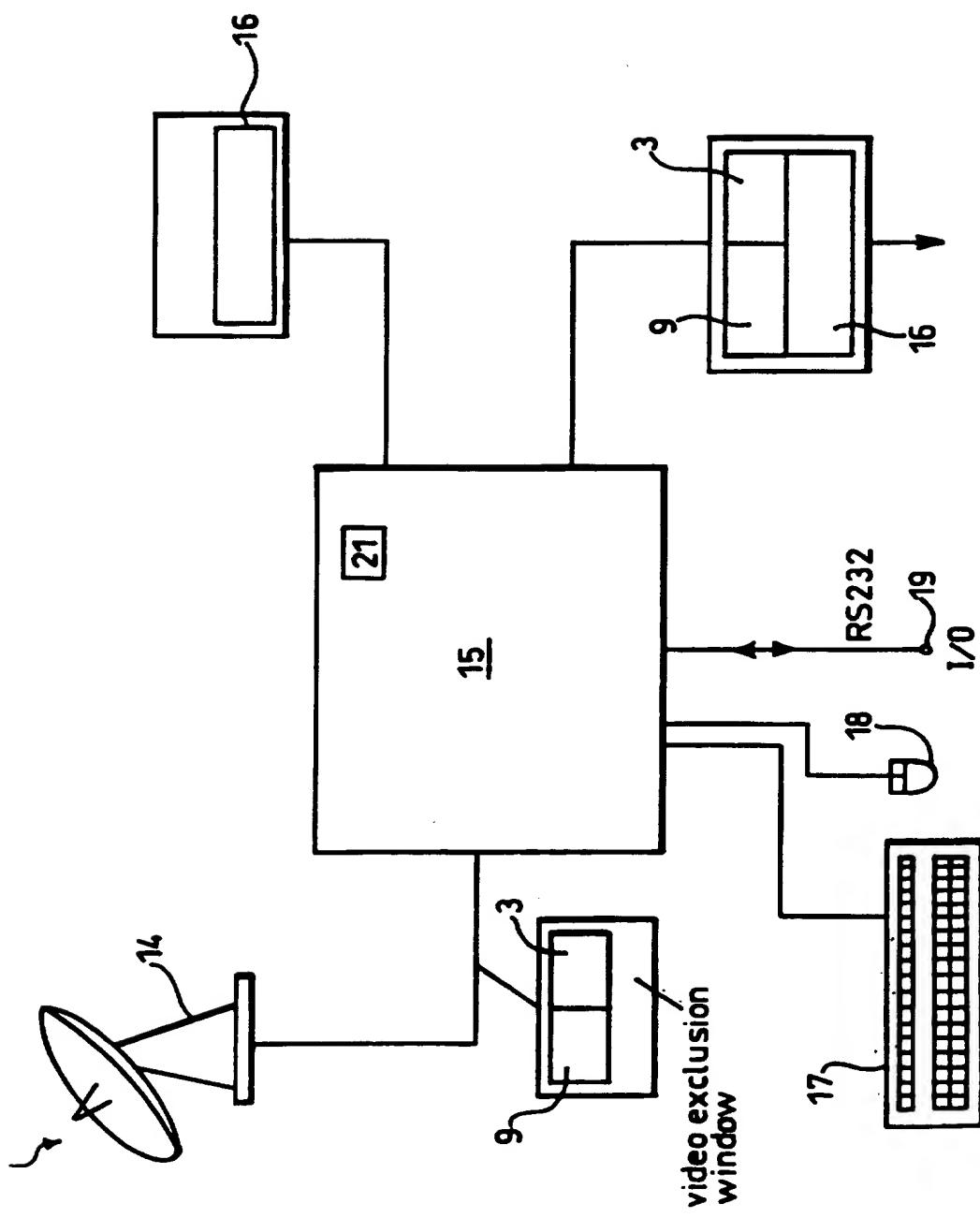
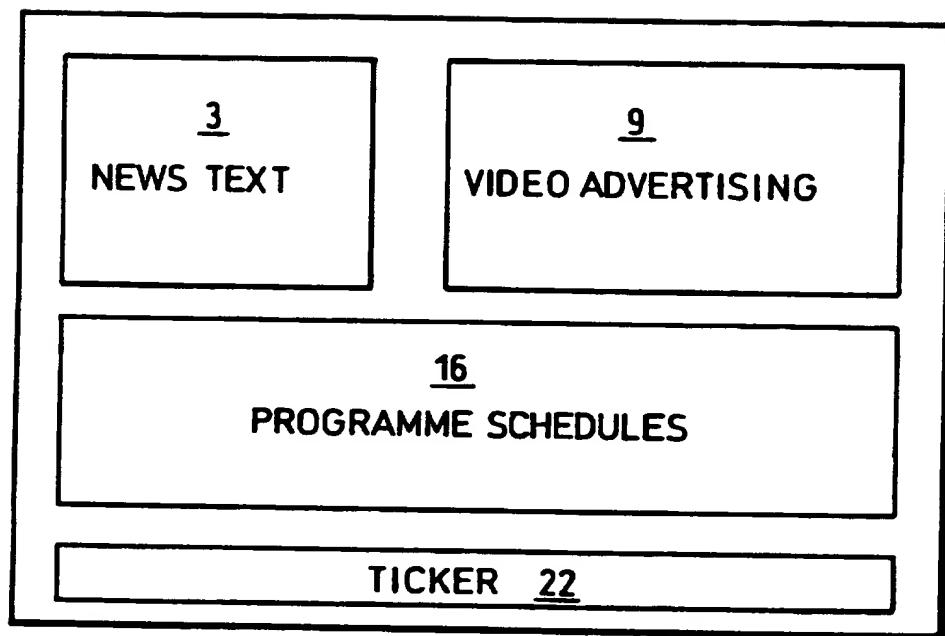


Fig.2.

3/3



*Fig.3.*

INFORMATION BROADCASTING

This invention relates to the broadcasting of information. In particular, it relates to the broadcasting of information as part of a television broadcast comprising several different types of programme and information for being received and viewed simultaneously at a television set. The invention is advantageously used with a cable television network.

With modern satellite and cable television systems many channels will typically be broadcast. For example, in India, a cable television company may distribute between twenty and thirty different television channels including several local television channels. In order that the viewer is aware of the various programmes available, programme schedules must be published. This may be done in the form of schedule magazines but it is becoming more common to broadcast programme schedules over the television network. The most common method of this is to publish a dedicated television channel which solely shows programme schedules.

A problem with dedicated television channels is that the television programme schedule information has to be constantly interrupted by commercials. These are essential to obtain the revenue for the channel. It is, however, difficult to maintain viewers interest in the channel through commercials when they are not watching a television programme as such but merely searching for programme schedule information. Also, if the programme schedules are locally generated they can be of poor quality.

According to the present invention there is provided apparatus for transmitting television signals, comprising means for transmitting a video signal taking up only some of the visible lines of the television signal, means for encoding non-video data onto at least some of

the remaining lines and/or the vertical blanking interval and means for transmitting the resulting signal.

According to the present invention there is further provided apparatus for receiving a television signal, which signal was transmitted by apparatus as described above, comprising means for receiving the combined signal, means for decoding the encoded data and applying this in a further video window, as video information, in the signal and means for viewing or transmitting the signal.

According to the present invention there is further provided a method of generating a television signal, comprising generating at least one window of video information, at least some of the visible lines of the television signal not being used by the or any windows and means for encoding non-video data on at least some of the unused lines of the signal and/or the vertical blanking interval.

In a further aspect, the invention provides apparatus for receiving a television signal, which signal was generated by the method defined above, comprising means for decoding the non-video data and applying this to at least one locally generated video window as video information and means for displaying or transmitting the resulting signal.

Embodiments of the invention will now be described, by way of example only, with reference to the accompanying drawings, in which:

Figure 1 shows a block diagram of apparatus for originating a television signal;

Figure 2 shows an apparatus for receiving and disseminating over a cable network the television signal; and

Figure 3 shows the television image viewed by an end user.

Referring to Figure 1, there is shown schematically an apparatus for generating and/or receiving a plurality of different types of information for transmission in a television signal. Programme scheduling information is generated by for example a personal computer (PC) 1 and may be text-based or have text and graphics for example. Programme schedule data may be input for each of the channels to be broadcast by the system and will be identified by a unique reference identifier, for example a channel number, for each channel. Thus, one channel, say CNN News, may be given number 13676, a second channel, say the BBC, may be given number 13677 and so on. This programme schedule information, representing not only the unique identifier but also the programme schedules to be shown by that channel that day are stored in the PC. Meanwhile, a conventional full motion video signal, which will typically bear advertising videos, is generated or may be played from a video cassette recorder, VCR 2. The video is to be shown in a window forming only a portion of the screen image as illustrated at 3 and this should therefore be borne in mind when producing the advertising or other video information. The video information from VCR 2 is applied to a video mixer 4.

The other element of the video information to be transmitted comprises textual news data. Raw news text is received at a decoder 5 from one of several international news providers such as UPI, Reuters, etc. This information may be received on line, or by satellite transmission for example. The decoder 5 receives a raw, continuously updated, news feed and applies this over a suitable interface such as an RS232 interface to a selector 6 which filters the raw text to provide a usable news text feed. The filtered text is applied to another interface such as an RS232 connection to a PC 7 (which may

be PC 1 or a separate PC). This has a video card 8 which converts the text data to data in video format. The news information, in video format again, takes up a second window of predetermined size in the image and is applied  
5 as a further input to the video mixer 4. At mixer 4, the two signals 3 and 9 representative of, respectively, the advertising full motion video and the news text are mixed together to produce a composite video signal 10 having both the advertisement 3 and news information 9 in  
10 adjacent windows.

PC 1, in addition to generating the programme schedule, is also optionally used to generate a regional 'ticker' which is a small window on a display which continually shows rolling information. This information  
15 may relate to local or international news or may be used to provide emergency alerts, public service information, or other types of information. This and the programme schedule data from PC 1 are applied over a computer interface to a vertical blanking interval (VBI) inserter  
20 10. This inserts the data at appropriate times, into the vertical blanking interval of the video signal output from video mixer 4, in known manner.

The VBI is commonly used to transmit information, whether this is teletext information, other  
25 data, data for use in facsimile message broadcasting or other data. In this case, the data which is inserted into the VBI is the programme scheduling information and, optionally, a regional ticker. Methods of inserting various types of data into the VBI are well known. The  
30 data may be continually inserted into the VBI or this may be done only periodically, say once every 24 hours since the VBI can carry a large amount of data (for example 4 megabytes/second).

Data may also be sent, as encrypted code, in  
35 those lines of the video signal which are not used by the

video windows.

The resulting video signal, including the data inserted into the VBI is output from inserter 10 and distributed as a video signal to, for example, a satellite transmitter 11. This transmits the signal to an orbiting satellite for retransmission to satellite downloaders.

The data is preferably inserted into the VBI in an encrypted form and the actual signal that would be received by a person not having suitable decryption circuitry is shown at 12. This would include the news and advertising windows but the area of the picture underneath these, for example extending over two to three hundred lines, would be blank since no video information is transmitted during these lines. Data may, however, be broadcast in these video exclusion lines, which data is unintelligible on a screen unless it has been decoded by a suitable decoder which converts the data to video data.

Figure 2 illustrates a receiving apparatus associated with a cable television network.

The incoming signal is received at a satellite receiver 14. This receives the video signal comprising the advertising and news windows 3 and 9 respectively within the television lines defined outside of the video exclusion window in which the programme scheduling and other information is to be overlaid. Lines within the video exclusion window may be interpreted as data but not as picture content. The received signal also of course has the programme schedule and other data contained in the VBI lines and also in the visible television lines within the video exclusion area. The television signal is transmitted to a decoder unit 15. This decodes the VBI and other non-video data and overlays this in its correct position 16 in the television signal. It may therefore include decryption software where the original VBI information was encrypted. A keyboard 17, mouse 18, or

other input apparatus is connected to the decoder 15 and may be used to configure the data or to add locally generated data to it. In preferred embodiments, only a small ticker portion at the bottom of the image is enabled 5 to have local data added to it, the rest of the data being fixed.

An input/output interface 19 may also be provided on decoder 15. This may be of the proprietary RS232 type for easy communication with external peripheral 10 devices such as computers.

The keyboard 17 or other input/output device is used firstly to 'map' the unique identifier numbers of each of the channels to local channel numbers, for example RF modulator channel numbers. This is because although 15 the same information may be broadcast to several different cable television operators, each will have a different combination of channels which will displayed and the user needs to be able to identify consistently each of the channels he is able to view, ie to know that channel one 20 is always Sky News, channel two CNN, and so on. These numbers may differ from those originally allocated to the channels when the information is originally broadcast and therefore at the cable television header the local channel identification numbers will be mapped to the received 25 channels. An authorised person can use the keyboard 17 to configure the decoded data such that when it is displayed each piece of programme schedule information is associated with the desired channel number. The keyboard 17 and other input/output apparatus may also be used to generally 30 configure the system and to enter text input, for example for rolling display on the horizontal 'ticker' line described above.

In the decoder, video signals received from the satellite information channel in the non-video exclusion 35 zone, ie the part bearing windows 9 and 13, are passed

through without modification for subsequent transmission over a cable or display. Video signals received in the video exclusion zone 20 are ignored and are replaced with the locally generated video which contains the regional 5 and local television schedules and also the local 'ticker' type information.

As described, it may be desired to broadcast television schedule information only once per day. These 10 may be broadcast once a day by the satellite information channel company as text on the VBI lines in the video exclusion zone of the satellite information channel. This information may be stored in non-volatile memory 21 in the equipment. Software is provided to map the received scheduling information to the local cable television 15 channel numbers, as configured via keyboard 17, so that when the television signal is actually broadcast the programme schedules are displayed against the correct local television channels.

For the 'ticker' part of the display, the 20 software for entering text for this 'ticker' may be provided by the satellite information channel and broadcast to the decoding unit 15. The 'ticker' takes the form of a text stream positioned at the bottom of the screen. The messages can be entered in advance and stored 25 in a memory for subsequent scheduling or impulse playing or could, in an emergency, be input directly as they are transmitted. Thus, the local cable television operator may broadcast his own simple text message advertisements, community messages, traffic and public announcements and 30 so on.

Interface 19 may also allow for control of 35 peripheral equipment at the cable television station so that stations can run generally unattended under control from the satellite information channel. Remote control features which may be used include; VCR playback of local

television channels for advertising, channel switching to copy important news to all or selected television channels and other features.

The software to control the process may, as  
5 described above, be downloaded by the satellite information company periodically to the cable company. In some embodiments, a heartbeat signal, that is a periodic signal of a certain type, is continually transmitted. As long as this heartbeat signal is received, then the  
10 software is maintained in the unit 15. If the heartbeat signal is not received, for example indicating that the main satellite is not transmitting, then the downloaded software programme may be deleted from the equipment. A separate heartbeat signal can be sent for each cable  
15 network, so that if one ceases to be an authorised receiver, the relevant heartbeat signal is discontinued, thus causing the software at that network to be deleted so that the network can no longer receive any data.

Figure 3 shows the picture viewed by a user of  
20 the local television company. Preferably, four windows are provided on the screen. The first of these 3 represents the news, the second window 9 shows advertisements produced at the satellite transmission company or other programmes, the third window 16, which will generally take up the largest part of the screen, displays the programme schedules, with the schedule information mapped to the correct local channel numbers and, finally, a horizontal 'ticker' 22 displays rolling information.

CLAIMS

1. Apparatus for transmitting television signals, comprising means for transmitting a video signal taking up only some of the visible lines of the television signal, 5 means for encoding non-video data onto at least some of the remaining lines and/or the vertical blanking interval and means for transmitting the resulting signal.
2. Apparatus as claimed in Claim 1, wherein the video data comprises at least two separate windows of 10 video signal.
3. Apparatus as claimed in Claim 2, wherein one of the video windows comprises information, for example news information, received from a third party.
4. Apparatus as claimed in Claim 2, wherein at 15 least one of the video windows comprises advertising videos.
5. Apparatus as claimed in any of the preceding claims, wherein the encoded data comprises television programming schedules.
- 20 6. Apparatus for receiving a television signal, which signal was transmitted by apparatus according to any of Claims 1 to 5, comprising means for receiving the combined signal, means for decoding the encoded data and applying this in a further video window, as video information, in the signal and means for viewing or transmitting the signal.
- 25 7. Apparatus as claimed in Claim 6, wherein input/output means are provided to configure the data and/or the video signal.
- 30 8. Apparatus as claimed in Claim 7, wherein at least part of the encoded data is television programme schedule information representative of a plurality of television channels, the information being transmitted by the transmitting apparatus with a unique code identifying 35 each channel and wherein the receiving apparatus comprises

means for inputting information to map the received unique code to a locally generated unique code to configure the programme schedule information representative of channels locally.

5        9.        Apparatus as claimed in any of Claims 6 to 8, further including means for locally generating an additional video window containing locally generated information.

10      10.      A method of generating a television signal, comprising generating at least one window of video information, at least some of the visible lines of the television signal not being used by the or any window and means for encoding non-video data on at least some of the unused lines of the signal and/or the vertical blanking interval.

15      11.      Apparatus for receiving a television signal, which signal was generated by the method of Claim 10, comprising means for decoding the non-video data and applying this to at least one locally generated video window as video information and means for displaying or transmitting the resulting signal.

20      12.      A method as claimed in Claim 11, wherein the data is representative of television schedule information and wherein, when transmitted, the schedule information for each particular channel is associated with a unique identifier, and wherein at the receiving step, locally generated channel numbers are mapped onto the remotely generated numbers to uniquely identify each channel schedule locally.

25      13.      A method as claimed in Claim 11 or Claim 12, further comprising generating an additional window of locally generated text data.

30      14.      Television apparatus substantially as hereinbefore described with reference to, and as illustrated by, the accompanying drawings.

**15. A method of generating or receiving a television signal substantially as hereinbefore described with reference to, and illustrated by, the accompanying drawings.**



# The Patent Office



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Claims searched: All

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## Patents Act 1977 Search Report under Section 17

### Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.O): H4F(FBA,FBB,FGG,FHT)

Int Cl (Ed.6): H04N(5/445,5/913,5/92,7/00,7/025,7/03,7/08,7/083,7/084,7/088,7/20)

Other:

### Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
X	EP 0566454A1	(TELEDIFUSION DE FRANCE) - see abstract	1,5-7,10-12
X	WO 95/32583	(TV GUIDE ON SCREEN) - see abstract and figs 5,6,6a,11,12	1,3-7,10-12
X	WO 93/12617	(BBC) - see abstract	1,10
X	WO 93/09635	(BBC) -see abstract	1,10
X	WO 91/00670	(THE SUPERGUIDE CORP) - see abstract and figure 1	1,5-8,10-12
X	US 4638359	(WATSON J.N.) - see abstract and figure1	1,3,6,8,9

- X Document indicating lack of novelty or inventive step  
Y Document indicating lack of inventive step if combined with one or more other documents of same category.

- A Document indicating technological background and/or state of the art.  
P Document published on or after the declared priority date but before the filing date of this invention.